Pragmatistic Pragmatics

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Charles Morris(1938) divided a linguist's meaning-related task into three branches—syntax, semantics, and pragmatics. Syntax in Morris' characterization deals exclusively with relations between linguistic expressions, and semantics with relations between expressions and whatever are considered to be their meanings. Pragmatics has to do with relations among expressions, their meanings, and users and/or contexts of use of those expressions.

In one of his early papers, Bar-Hillel(1954) proposed that pragmatics cover the study of indexical expressions, expressions whose reference cannot be determined without knowledge of the context of use. However, Richard Montague and his colleagues laid the foundations for what is now known as indexical semantics in the general framework of model-theory. An example representative of Montague's view of pragmatics is found in the paper entitled 'Universal Grammar', where he distinguished senses from meanings. The former are defined to be functions of a possible world while the latter as functions of two arguments—a possible world and a context of use. Due to this precise technical structure given to the indexical semantics, Richmond Thomason suggested that the study of the meanings of indexical expressions be treated in the semantic component rather than in the pragmatic one in a general program of natural language analysis. While this leaves for a genuinely pragmatic theory the study of presupposition, speech acts conditions, and implicatures, we need to have a better understanding of what these apparently disparate subjects represent from some underlying holistic structure of pragmatics.

Stalnaker(1971) in a similar vein viewed the major task of pragmatics as one of definitizing a proposition for a given interpreted sentence. Stalnaker's and Thomason's suggestions taken together carve out a rather intriguing research area for a pragmatistic linguist like myself. Talking about pragmatistic pragmatician, I am not just playing with words. Many of us, professional linguists who are concerned with the immediate future of our better students have been driven into a pragmatistic view, a view that forces them into a search for some more marketable research area in which our students can still be engaged in an intellectually rewarding and challenging enterprise, still working on theoretic aspects of natural language studies. Thus the term pragmatism. I mean to refer by the term to a theoretical attitude that tends to appraise the value of a conception according to its practical results or effects.

For the reasons to be made clear, I am going to call the kind of pragmatics alluded to above pragmatistic pragmatics. Pragmatistic pragmatics deals with those aspects of natural language meaning that crucially depend on some features of the context of use but not amenable to any rigorous formal treatment known to-date such as model-theoretic treatment.

One example of pragmatistic pragmatics has to do with ellipsis. While the indexical semantics is also concerned with definitizing a proposition for a given interpreted sentence, the definitization in indexical semantics is carried out on a general level in terms of some general complexes of relevant aspects of intended possible contexts of use. These complexes are sometimes called indices or points of reference. Pramatistic pragmatics has to do with definitizing propositions on a not so general level. One example of ellipsis is taken from McCawley (1981). Consider the following analysis of the definite description in Russellian traditon expressed here in the restricted quantification notation.

(1) The dog is hungry. $(\imath_x\ \mathrm{Dog}_x)\ \mathrm{Hungry}_x$

(2) The dog likes all dogs. $(\imath_x\ \mathrm{Dog}_x\ \&\ *_x)\ (\forall_y\ \mathrm{Dog}_y)\ \mathrm{Like}_{xy}$[1]

According to the usual model-theoretic semantics, sentence (1) can be assigned a truth condition in such a way that it comes out true iff there is one and only one object in the value set of *dog* and that object is an element of the value set of *hungry*.

But such a scheme does a gross violation to our intuition when we consider a sentence such as (2). If a plural NP requires a non-singleton set as its extension, sentence (2) expresses a contradiction. One way of avoiding the problem might be by having context domain distinctly from discourse domain, the former being a rather volatile member of the power set of the latter. Several context domains might be activated simultaneously in interpreting a sentence. One might provide a set of activation conditions as a way of selecting a particular subset of the discourse domain as a context domain for a particular expression. Much simpler and more intuitive it seems to me at the moment is it to deal with the semantics of sentence (2) in terms of ellipsis. The sentence then is interpreted as asserting that the intersection set between the set of dogs and the extension set of some property or property set to be specified contextually or discoursewise is a singleton set and its unique element is in the *like* relation with all the dogs in the domain. Such a pragmatic property set is also needed for an adequate analysis of modal expressions in choosing a particular subset of the total set of possible worlds in interpreting a specific modality involved. It is necessary for a comprehensive treatment of predicate adjectives. In his paper entitled 'English as a formal language', Montague(1970) gave the semantics of sentences containing predicate adjectives in one of the rules(S17), which makes (3) synonymous with(4).

[1] '*' represents the context property that is involved in interpreting an expression.

(3) The elephant is small.

(4) The elephant is a small entity.

Under this analysis, we have some basis for an account of our intuition involving the following two sentences:

(5) Kim is a more brilliant AI researcher than his father.

(6) Kim is an AI researcher who is more brilliant than his father.

While sentence (5) clearly entails that Kim's father is also an AI researcher, sentence(6) leaves his profession unspecified. It is not difficult to invent a truth condition for a sentence containing an attributive adjective as in (5) so that attention may be limited to the set of AI researchers. Montague's rule assigns/provides a distinct context domain for a sentence involving a predicate adjective as in sentence (6). Here the focussed context domain is the discourse domain itself. But Montague's analysis of predicate adjectives needs to be further fine-tuned. Sentence (3) can be quite natural despite the truth condition forced upon it by Montague, according to whom the sentence may be true only in a bizarre situation. The sentence might be used to assert that a particular elephant is small as an elephant, as a mammal, as a jungle animal, or in a more bizarre context indeed as an entity. In determining what proposition is intended by the utterance of the sentence in a given context, one needs to know the intended context domain which the elliptic '*2' is to supply in the following representation:

(7) $(\iota_x \text{ Elephant}_x \ \& \ *1_x)(\text{Small}_x \ \& \ *2_x)$

Ellipsis is only a special case of pramatistic pragmatics. Majority of examples of what is known as presupposition also illustrate pragmatistic pragmatics in that they also involve some specific contextual features which limit the set of possible worlds to be considered in determining a particular subset of it which constitutes the proposition in question. One might object to the inclusion of presupposition in pramatistic pragmatics on the basis of Karttunen and Peter's(1979) model-theoretic treatment of the so-called conventional implicature they presented in their celebrated paper 'Conventional Implicature'. But Karttunen and Peters' program does not seem to be necessary with all its complexity or adequate if the program is to be ambitious enough to cover more than just the semantic presupposition. Assuming that individual items and certain constructions need to be associated with certain implicatures, the tremendous complication due to the introduction of heritage features we maintain is too exorbitant a price to pay for the resolution of presupposition problem. But for the cancellation phenomenon, Langendoen and Savin's(1971) straightforward cumulative project would have sufficed. This cancellation problem has been attacked in a way that does not involve as much complication in Gazdar (1979) and Oh & Godden (1979). The latter paper attempts to resolve the projection problem of presupposition in terms of some natural principle governing human behavior in general much in harmony

with the Gricean principles.

Karttunen and Peter's program need to be made more sensitive to certain contextual features in order to be pragmatically adequate. While it is true that sentence (8) does not semantically presuppose that someone other than Tom is expected to have left, in majority

(8) John asserts that even Tom left.

of contexts the use of the sentence does carry that presupposition. It does not seem to be too unreasonable a demand on an adequate semantic theory to be discerning as to the relations between certain contextual features and presence/absence of certain presuppositions.

A fuller understanding of pragmatic meanings of an expression seems to involve a large number of underlying principles governing human behavior in general. Gricean maxims and the principle discussed in Oh & Godden(1979) are some examples. The versatility of human communication is another aspect that should be kept in mind. This versatility is demonstrated in the use of so-called pronouns of laziness, in the attributive use of definite descriptions, and in presupposition-turned assertion situations.

(9) Is Alexander his last name or first name?
(10) The man in the purple turtleneck shirt might have been someone else.
(11) I regret (to inform) that children are not admitted to this party.

In (9), we have an example of dual referencing, the noun Alexander referring to the person and his name all at the same time. One reading of sentence (10) is a rather unrealistic one, viz. that it is possible that a certain individual might have been an exception to the reflexivity of identity relation. A more reasonable reading is that a certain person has the property of being a unique man in the purple turtlenck shirt but that someone else might have had that same property. McCawley's(1981) analysis of a predicatively used definite description does not help here. McCawley proposes to translate the sentence form in (12) to (13b) rather than more conventional (13a).

(12) Z is the Y.
(13) a. $(\iota_x\ Y_x)\ z=x$
b. $Y_z\ \&\ (\forall_x\ Y_x)\ x=z$

While this general scheme can be tempered with so that it can produce the desired translation in (14a), it has an insurmountable problem when it comes to the negation. How should one translate(15)? Neither the negation of the first conjunct nor that of the second conjunct does justice to our intuition. The reading corresponding to the internal negation in Russellian notation is not available.

(14) a. $(\exists_x M_x)((\forall_y M_y)(x=y)\ \&\ \Diamond P((\exists_y\ x\neq y)M_y\ \&\ (\forall_z M_z)\ z=y))$
b. $(\exists_x)(M_x\ \&\ (\forall_y)(M_x \supset x=y)\ \&\ \Diamond P((\exists_y)x\neq y\ \&\ x=y))$

(15) Z is not the Y.

Therefore if we want (14a) as a reading of (10), we must resort to some other scheme. I have a strong suspicion that here again we have a case of the versatility of human communication; in the last conjunct of the more conventional translation (14b) the first occurrence of the variable x is referentially used while the second one attributively in Donnellan's sense, all made possible through the versatility of human language. In the normal context, sentence (11) would be used to express the speaker's feeling (of regret) toward an event or state that is already presupposed, but people use the sentence often to inform what is supposedly already presupposed. We see a form of meta-rule taking advantage of a system of rules for a side effect, once again demonstrating the versatility of the language use.

Paradoxically enough the examples of human versatility in the language use together with the tremendous complexity of pragmatistic pragmatics reveal the indispensibility of the use of the nonhuman tool, the computer. The practically unlimited memory space and speed as well as the blind obedience (or put it differently the lack of versatility in the sense used above) make the computer an extremely useful tool for pragmatistic pramgatics as it has proven to be for other areas.

Now the promised justification for the term the pragmatistic pragmatics. Due to the tendency away from mere academic pursuits in the general public and governments in the way of research funding and students' selection of their majoring fields, the discipline of linguistics is experiencing some unprecedented strain as is the case with many other humanity disciplines. Those few who simply had to turn to linguistics due to their almost fatelike desire to study human language on theoretic realm are increasingly threatened with the gloomy prospect of joblessness and impossibility to support their family in case they were brave enough to choose to have one. More timid ones turn away to some more marketable areas with the love of natural language study still in their heart. Until we explore more deeply into pragmatistic pragmatics, linguistics would remain virtually unreachable from the practically unlimited resources which are just as eager to reach us as we are to interest them for future generations of linguists. It is not an accident that many theory-oriented linguists turn to the newly emerging discipline of artificial intelligence. To list just a few pieces of evidence, there is this journal *computational linguistics*, the subscription of which has increased at a rate totally unpredicted by its own editorial board. Many linguistics departments around the world are adding to their curriculum ever-increasing number of computer-related courses. Furthermore not a few computer-science departments are adding to their curriculum linguistically-related courses. This is largely because of the potential that computer scientists see in the natural language-related researches. Linguists have watched for several decades the health-science related research field with envy due to the magnonymous amount of funding that is poured into it. Quite a few

research proposals have been successfully made for the study of natural language data for the purpose of facilitating medical researches in recent years, for example. In this sort of researches, pragmatistic pragmatics plays a major role.

Artificial intelligence field offers theory-oriented linguists excellent opportunities to pursue their researches to their hearts' satisfaction maintaining a well-paying job. One of my students wrote a computer program much like Joyce Friedman's PTQ English program, but in this student's case he wrote a program on a Thai fragment comparable to Friedman's English fragment as a part of Montague-based machine translation project. With his Ph.D. in linguistics, he got a job at a large computer-science department. After teaching two years and being offered a tenure, he accepted a position at the computer department of General Motors working on a question-answer system for the employees. His pay now amounts to approximately triple as much as what assistant professors of linguistics are paid in an average linguistics department in the States.

The area in which linguists can contribute much includes in addition to pragmatistic pragmatics the translation theory, query system, knowledge representation area, formal language theory, formal semantics, theory-testing, theorem proving, pattern recognition, etc. in sum, developing, improving, extending and generalizing from artificially intelligent systems. One episode from the University of Michigan illustrates just a side benefit of having the computer assistance in AI-related researches. While they were working on translation and reduction programs for the PTQ fragment, realizing that the λ-reduction is possible for $\lambda v A(b)$ only when either b is modally closed or no free occurrence of variable v in A is in an intensional context, wished to find what sort of non-contractable formulas there exist. So they wrote a program to print a message whenever it encountered a functional argument which is not modally closed. When this failed to show up any example over the course of time, they began to conjecture and eventually proved that the functional arguments in PTQ are always modally closed.

Having experienced and still experiencing for that matter even now the difficulty of jumping across several disciplines without a proper background work, we feel that the time is ripe to help our new generation of linguists by providing a program to START them properly on the course of formal linguistics or natural-language related AI work. We, for example, at the University of Kansas have started a new subprogram in linguistics with curriculum organized with courses from mathematics, computer science, philosophy as well as linguistics tapered for that purpose that will prepare our future students for the kind of work we have talked about in the paper. I will be more than happy if I have been able to stimulate interest in some of you to look in the direction where the future of linguistics lies given time.

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